

DECLARATION

I, *Makiko Hosono*, of 8-10, Toranomom 2-Chome, Minato-ku, Tokyo, Japan hereby declare that I am well acquainted with the Japanese and English languages and that the attached document is a true translation into English made by me of a certified copy of the priority document in connection with Japanese patent application identified below to the best of my knowledge and belief.

Application No. : J.P. Application No. 2002-311935

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Declared and Signed this 25 day of March, 2004.

By: *Makiko Hosono*

[Name of Document] SPECIFICATION

[Title of the Invention] ANTI-PANIC MECHANISM OF VEHICLE DOOR LATCH
DEVICE

[Scope of Claim for a Patent]

[Claim 1] An anti-panic mechanism of a vehicle door latch device, the anti-panic mechanism comprising: an open lever 27 displacing from a stand-by position to a door-open operating position with a door-open operation of an exterior door-opening handle 28 of a door; a lock lever 30, coupled to an interior lock button 32 of the door, switching between an unlocked position U and a locked position L; an open link 40 switching between an engaging position at where the displacement of the open lever 27 is transmitted to a ratchet pin 24 of a ratchet 13 if the lock lever 30 is in the unlocked position U, and a non-engaging position at where the displacement of the outer open lever 28 is not transmitted to the ratchet pin 24 of the ratchet 13 if the lock lever 30 is in the locked position L; and an operating piece 35, coupled so as to cooperatively operate with respect to the lock lever 30 with an elastic force of an anti-panic spring 36, for transmitting the displacement between the locked position L and the unlocked position U of the lock lever 30 to the open link 40; characterized in that when the lock lever 30 is displaced from the locked position L to the unlocked position U while the open lever 27 is in the door-open operating position, the anti-panic spring 36 is elastically widened to switch the lock lever 30 to the unlocked position U without the operating piece 35 moving, the operating piece 35 being axially fixed to a lock shaft 31 axially fixing the lock lever 30.

[Detailed Description of the Invention]

[0001]

[Technical Field Pertinent to the Invention]

The invention relates to an anti-panic mechanism of a vehicle door latch device.

[0002]

[Prior Art]

[Patent Document 1] Japanese U. M. Application Laid-Open No. 58-101949

[Patent Document 2] Japanese Patent Application Laid-Open No. 11-324451

In a conventional most commonly used vehicle door latch device, an unlock

operation by means of an interior lock button and the like is not properly completed in a state in which an exterior door-opening handle of a door is door-open operated. In this field of business, such state is referred to as a panic state. In the panic state, the exterior door-opening handle is returned to a non-operating state and the unlock operation must be re-performed with the interior lock button and the like.

The patent documents 1 and 2 disclose a door latch device equipped with the anti-panic mechanism for preventing the panic state from occurring. In the known anti-panic mechanism, even if the unlock operation is not properly completed due to the door-open operation of the exterior door-opening handle, once the exterior door-opening handle is returned to the non-operating state, a switch to the unlocked state is completed following such return of the handle, thus eliminating the re-performance of the unlock operation.

[0003]

[Problem that this Invention is to solve]

The known mechanism includes an operating piece urged with a spring to achieve the anti-panic mechanism, which operating piece is axially fixed to an existing component of the door latch device with an axially-fixing pin dedicated to the operating piece. Thus, there is an increase in the number of components.

[0004]

[Means for Solving the Problem]

The present invention therefore provides an anti-panic mechanism of a vehicle door latch device including an anti-panic mechanism of a vehicle door latch device, the anti-panic mechanism comprising, an open lever 27 displacing from a stand-by position to a door-open operating position with a door-open operation of an exterior door-opening handle 28 of a door, a lock lever 30, coupled to an interior lock button 32 of the door, switching between an unlocked position U and a locked position L, an open link 40 switching between an engaging position at where the displacement of the open lever 27 is transmitted to a ratchet pin 24 of a ratchet 13 if the lock lever 30 is in the unlocked position U, and a non-engaging position at where the displacement of the outer open lever 28 is not transmitted to the ratchet pin 24 of the ratchet 13 if the lock lever 30 is in the locked position L, and an operating piece 35, coupled so as to cooperatively operate with respect to the lock lever 30

with an elastic force of an anti-panic spring 36, for transmitting the displacement between the locked position L and the unlocked position U of the lock lever 30 to the open link 40, characterized in that when the lock lever 30 is displaced from the locked position L to the unlocked position U while the open lever 27 is in the door-open operating position, the anti-panic spring 36 is elastically widened to switch the lock lever 30 to the unlocked position U without the operating piece 35 moving, the operating piece 35 being axially fixed to a lock shaft 31 axially fixing the lock lever 30.

[0005]

[Embodiment]

Fig. 1 is a front view of a door latch device according to the present invention. The door latch device includes a latch assembly 10 attached to a door (not shown) and a striker 11 fixed to a vehicle body (not shown). The latch assembly 10 includes a latch 12 that engages with the striker 11 when the door closes and a ratchet 13 that holds the engagement between the latch 12 and the striker 11. The latch 12 is rotatably accommodated within a recess 15 formed on a front surface of a latch body 14 with a latch shaft 16 extending in a longitudinal direction. The ratchet 13 is rotatably accommodated within the recess 15 with a ratchet shaft 17 extending in the longitudinal direction.

[0006]

The latch 12 is urged in a clockwise direction in Fig. 1 by an elastic force of a latch spring 18, and the ratchet 13 is urged in a counter-clockwise direction by an elastic force of a ratchet spring 19. The latch 12 in Fig. 1 is in an unlatched position (door-open position) by the elastic force of the latch spring 18. When the door moves toward the door-closed position, the striker 11 abuts against a U-shaped groove 20 of the latch 12, thus rotating the latch 12 in the counter-clockwise direction. When the latch 12 rotates to a half-latched position, the ratchet 13 engages a first step portion 21 of the latch 12, holding the door in a half door-closed position. When the latch 12 reaches a full-latched position, the ratchet 13 engages a second step portion 22 of the latch 12, holding the door in a full door-closed position.

[0007]

The ratchet 13 includes a ratchet pin 24 projecting on a back surface side of the

latch body 14 through an opening 23 of the latch body 14. A metal cover plate 25 covering the recess 15 is fixed to the front surface of the latch body 14. The cover plate 25 is partially shown in Fig. 1.

[0008]

A metal back plate 26 is fixed on a back surface of the latch body 14, as shown in Fig. 2. The back plate 26 includes a parallel plate 26A substantially parallel with the cover plate 25, and the latch body 14 is sandwiched between the cover plate 25 and the parallel plate 26A from the front and the back side. A bending plate 26B extending backwards away from the latch body 14 is arranged on a side face on an interior side of the parallel plate 26A.

[0009]

Reference number 27 denotes an open lever axially fixed to the parallel plate 26A (latch body 14) with a latch shaft 16 or another shaft. The open lever 27 is coupled in relation to an exterior door-opening handle 28 and an interior door-opening handle 29, and is pivoted in the counter-clockwise direction in Fig. 2 with the door-open operation of the handles.

[0010]

Reference number 30 denotes a lock lever axially fixed to the parallel plate 26A (latch body 14) with a lock shaft 31. The ratchet shaft 17 may also be used as the lock shaft 31. The lock lever 30 is placed between the parallel plate 26A and the latch body 14. The lock lever 30 is coupled in relation to an interior lock button 32 (and in some cases with a door key cylinder 33), and with the operation thereof, is displaced and held at a locked position L or an unlocked position U with a dead point of an over center spring 34 as the border.

[0011]

An anti-panic operating piece 35 is axially fixed to the lock shaft 31. The main part of the operating piece 35 is arranged on the backside of the parallel plate 26A and an anti-panic spring 36 is arranged between the operating piece 35 and the lock lever 30. A coil 36A of the spring 36 is wound around the lock shaft 31. One end 36B of the spring abuts against a projecting part 37 of the lock lever 30 extending beyond the parallel plate 26A and projecting in the backward direction, and the other end 36C abuts against a projecting part

38 of the operating piece 35. The operating piece 35 is urged in the unlocking direction and is held elastically while being abutted against the lock lever 30 with the spring 36.

[0012]

A pin 39 that projects on the front side is integrally formed with the operating piece 35. The pin 39 slidably engages a back side guide slot 41 of an open link 40. An upper part of the open link 40 is axially fixed to the open lever 27. When the operating piece 35 is displaced to the locked position (Fig. 4, 5) or the unlocked position (Fig. 2, 3) with the lock lever 30 by the elastic force of the spring 36, the open link 40 is also displaced to the locked position or the unlocked position.

[0013]

The front face side of the open link 40 includes an abutment face 42A. The abutment face 42 engagingly faces the latch pin 24 in the vertical direction when the open link 40 is in the unlocked position (Fig. 2, 3). When the open link 40 moves downward through the rotating movement of the open lever 27, the abutment face 42 pushes the ratchet pin 24 downward, releasing the ratchet 13 from the latch 12. The door is thus opened. When the open link 40 is displaced to the locked position (Fig. 4, 5), the abutment face 42 moves next to the ratchet pin 24, and thus the door is not opened even if the open link 40 is moved downward.

[0014]

A passage 43 of the ratchet pin 24 is formed on the front face side of the open link 40, and when the open link 40 moves downward when in the locked position, the ratchet pin 24 relatively moves upward within the passage 43. A blockage wall 44 is formed on side faces on the locked position side of the passage 43 to regulate the return of the open link 40 to the unlocked position when the ratchet pin 24 relatively moves upward within the passage 43.

[0015]

[Action]

In the unlocked state of Fig. 2, when the interior lock button 32 and the like is lock operated, the lock lever 30 is pivoted in the clockwise direction and is moved beyond the dead point of the over center spring 34 to the locked position L, thus the operating piece

35 is moved to the locked position. Further, the open link 40 is displaced to the right and moved to the locked position. The locked state of Fig. 4 is thus obtained.

[0016]

In the locked state, when the exterior door-opening handle 28 or the interior door-opening handle 29 is door-open operated, the open lever 27 is pivoted in the counter-clockwise direction as shown in Fig. 5, and the open link 40 is moved downward. However, in the locked state, the abutment face 42 of the open link 40 is not facing the ratchet pin 24, and thus the ratchet pin 24 is not moved downward and the door can not be opened.

[0017]

In the locked state, however, when the exterior door-opening handle 28 or the interior door-opening handle 29 is door-open operated to obtain the state shown in Fig. 5, if the interior lock button 32 and the like is unlock operated, conventionally, the panic-state occurs and the displacement of the lock lever to the unlocked position is not completed. In the present invention, however, in a state shown Fig. 5, when the interior lock button 32 and the like is unlock operated, the lock lever 30 is independently displaced to the unlocked position U as shown in Fig. 6 leaving the operating piece 35 in the locked position.

[0018]

That is, as shown in Fig. 5, when the open link 40 moves downward in the locked state, the ratchet pin 24 enters the passage 43 of the open link 40, thus regulating the switch to the unlocked position of the open link 40. Further, the switching of the operating pin 35, with the pin 39 engaging the guide slot 41 of the open link 40, to the unlocked position is also regulated. Thus, the lock lever 30 elastically widens the anti-panic spring 36 while being independently displaced to the unlocked position, as shown in Fig. 6, through the unlock operation of the interior lock button 32 and the like, and is held in the unlocked position U by the elastic force of the over center spring 34.

[0019]

In a state shown in Fig. 6, when the exterior door-opening handle 28 or the interior door-opening handle 29 is returned from the door-open operating position, the open lever 27 rotates in the clockwise direction and the open link 40 moves upward. Thus, the ratchet pin 24 in the passage 43 of the open link 40 separates away from the passage 43

(blockage wall 44). This cancels the regulation of the open link 40 and of the operating piece 35 to the unlocked position, and thus the open link 40 and the operating piece 35 both return to the unlocked position with the elastic force of the anti-panic spring 36. Therefore, the latch device is switched to the unlocked state without re-performing the unlock operation by means of the interior lock button 32 and the like.

[0020]

In the present invention, the operating piece 35 urged with the anti-panic spring 36 is axially fixed with the lock shaft 31 commonly shared with the lock lever 30. Thus, a dedicated component for axially fixing the operating piece 35 is not necessary. Further, since the lock lever 30 rotates about the lock shaft 31 to switch between the locked position and the unlocked position, a region overlapping the lock lever 30 becomes the region suitable for arranging a rotating member, and thus it becomes extremely rational to axially fix the operating piece 35 to the lock shaft 31 to arrange the operating piece 35 and the lock lever 30 in an overlapping manner.

[0021]

[Effect of the Invention]

In the present invention, the operating piece 35 urged with the anti-panic spring 36 is axially fixed with the lock shaft 31 commonly shared with the lock lever 30. Thus, a dedicated component for axially fixing the operating piece 35 is not necessary. Further, since the lock lever 30 rotates about the lock shaft 31 to switch between the locked position and the unlocked position, a region overlapping the lock lever 30 becomes the region suitable for arranging a rotating member, and thus it becomes extremely rational to axially fix the operating piece 35 to the lock shaft 31 to arrange the operating piece 35 and the lock lever 30 in an overlapping manner.

[Brief Description of the Drawings]

[FIG. 1] FIG. 1 is a front view of a door latch assembly of the present invention.

[FIG. 2] FIG. 2 is a rear view showing a member arranged on a rear side of the door latch assembly.

[FIG. 3] FIG. 3 is a cross sectional view showing an abutment face and a passage of an open link of the door latch assembly.

[FIG. 4] FIG. 4 is a schematic view of each member in a locked state.

[FIG. 5] FIG. 5 is a schematic view showing a rotating movement in a door-opening direction of the open lever in the locked state.

[FIG. 6] FIG. 6 is a schematic view showing a switch to an unlocked position of the lock lever in the state of Fig. 5.

[Description of Reference Numerals]

10...latch assembly,	11...striker,	12...latch,
13...ratchet,	14...latch body,	15...recess,
16...latch shaft,	17...ratchet shaft,	18...latch spring,
19...ratchet spring,	20...U-shaped groove,	21...first step portion,
22...second step portion,	23...opening,	24...ratchet pin,
25...cover plate,	26...back plate,	26A...parallel plate,
26B...bending plate,	27...open lever,	
28...exterior door-opening handle,		
29...interior door-opening handle,		30...lock lever, 31...lock shaft,
32...interior lock button,	33...door key cylinder,	34...over center spring,
35...operating piece,	36...anti-panic spring,	37...projecting part,
38...projecting part,	39...pin,	40...open link,
41...guide slot,	42...abutment face,	43...passage,
44...blockage wall		

[Name of Document] **ABSTRACT**

[Summary]

[Object] To provide an efficient anti-panic mechanism of a vehicle door latch device.

[Constitution] In the anti-panic mechanism of the vehicle door latch device, when a lock lever 30 is displaced from a locked position L to an unlocked position U while an open lever 27 is in a door-open operating position, an anti-panic spring 36 elastically widens to switch the lock lever 30 to the unlocked position U without an operating piece 35 moving, which operating piece 35 is axially fixed to a lock shaft 31 axially fixing the lock lever 30.

[Selected Diagram] **FIG 2**

FIG. 1

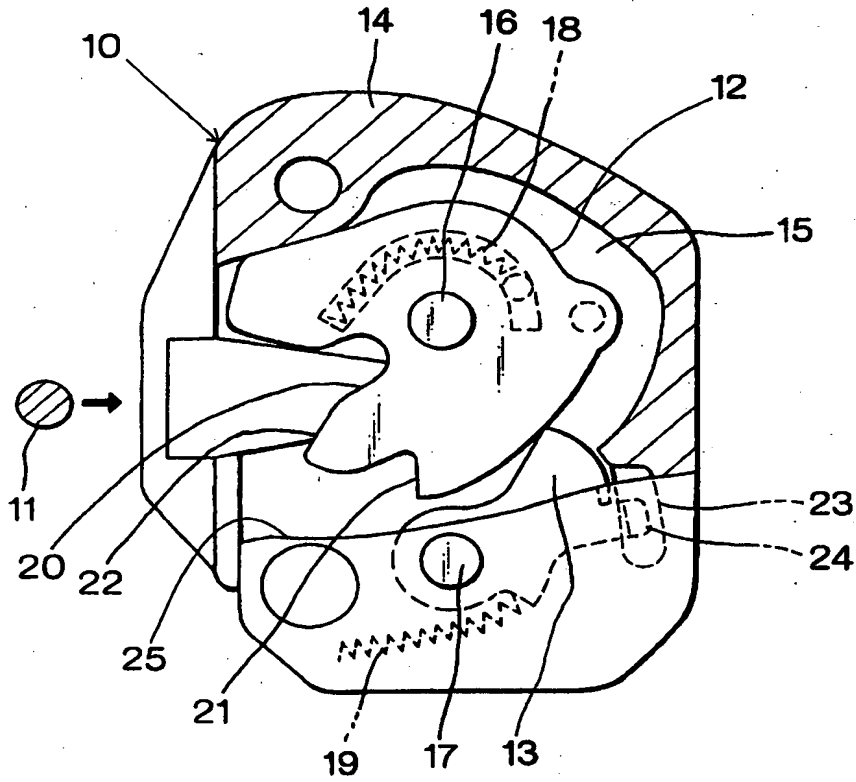


FIG. 3

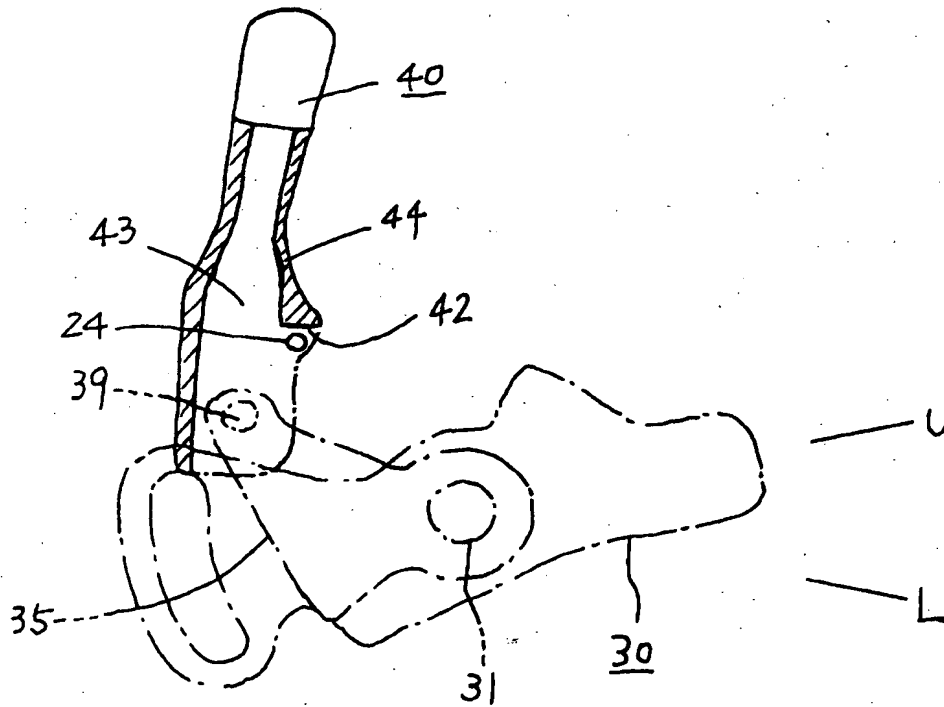


FIG. 4

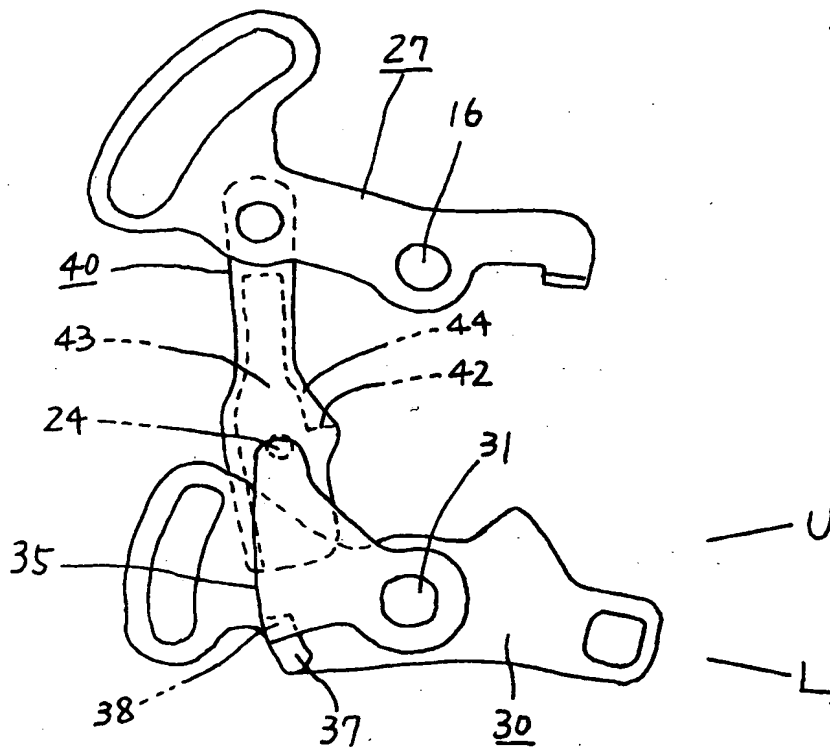




FIG. 5

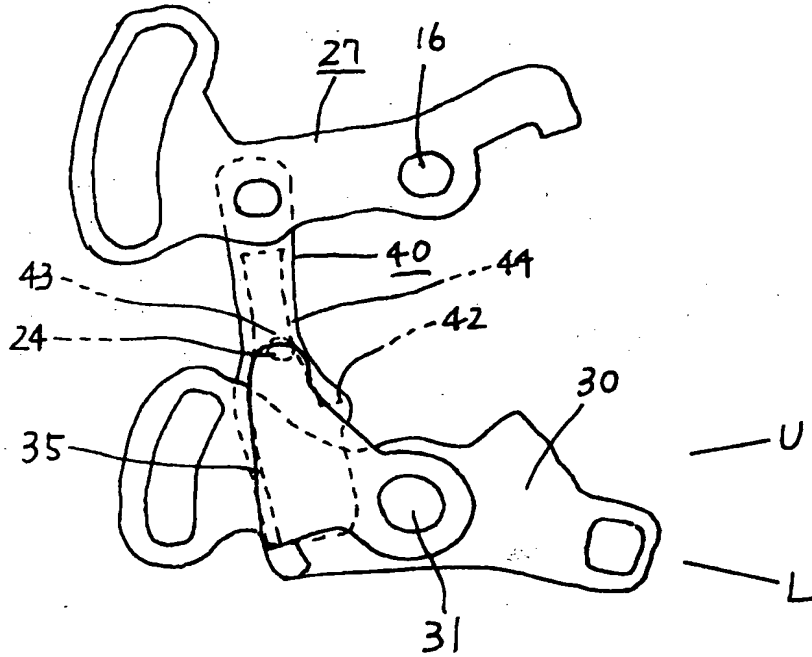


FIG. 6

